

Engineering Interpretations

Building Site Development

Soil properties influence development of building sites, including the selection of the site, the design of the structure, construction, post construction performance, and maintenance. Soil limitation ratings of slight, moderate, and severe are given for shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns, landscaping, and golf fairways.

Shallow Excavations

Shallow excavations are trenches or holes dug in the soil to a maximum depth of 5 or 6 feet. They are used for pipelines, sewer lines, telephone and power transmission lines, basements, open ditches, and cemeteries. The ratings are based on the soil properties that influence ease of digging and resistance to sloughing.

Dwellings With or Without Basements

These are single-family houses of three stories or less. The foundation is assumed to be spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or the depth of maximum frost penetration, whichever is deeper, for houses without basements, or at a depth of 7 feet if a basement is constructed. The ratings are based on properties affecting soil strength and settlement under a load, and those that affect excavation and construction costs.

Small Commercial Buildings

Limitation ratings are given for the undisturbed soil on which small commercial buildings of less than three stories without basements are built. The foundation is assumed to be placed on spread footings of reinforced concrete at a depth of 2 feet or the depth of maximum frost penetration, whichever is deeper.

Local Roads and Streets

Limitation ratings are given for the use of soils for construction of improved local roads and streets that have all-weather surfacing, commonly of asphalt, gravel with binder in it, or concrete, and that are expected to carry automobile traffic all year. These roads and streets are graded to shed water, and conventional drainage measures are provided. With the probable exception of the hard surface, roads and streets are built mainly from the soil at hand.

Lawns, Landscaping, and Golf Fairways

The soils are rated for their use in establishing and maintaining turf for lawns and golf fairways and ornamental trees and shrubs for residential type landscaping. The ratings are based on the use of soil material at the location with some land smoothing. Irrigation may or may not be needed and is not a criterion in rating. Traps, trees, roughs, and greens are not considered as part of the golf fairway. The properties considered are those listed that affect plant growth and trafficability after vegetation is established.

This subsection includes:

- **(a) Building Site Development**

Table 16.--Building Site Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Dwellings without basements		Dwellings with basements		Small commercial buildings		Local roads and streets		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
40000: Barden-----	Very limited shrink-swell (very limited)	1.00	Very limited shrink-swell (very limited) wetness (very limited)	1.00 1.00	Very limited shrink-swell (very limited)	1.00	Very limited low strength (very limited) shrink-swell (very limited)	1.00 1.00	Not limited	
40011: Barco-----	Moderately limited hard bedrock (moderately limited)	0.45	Very limited hard bedrock <40" (very limited)	1.00	Moderately limited depth to bedrock (moderately limited)	0.45	Very limited low strength (very limited) depth to bedrock (moderately limited)	1.00 0.45	Slightly limited depth to bedrock (slightly limited)	0.30
40015: Eldorado-----	Limited large stones (limited)	0.96	Limited large stones (limited) shrink-swell (slightly limited)	0.96 0.05	Limited large stones (limited)	0.96	Limited large stones (limited)	0.96	Not limited	
40016: Eldorado-----	Very limited large stones (very limited)	1.00	Very limited large stones (very limited) shrink-swell (slightly limited)	1.00 0.04	Very limited large stones (very limited) slope (moderately limited)	1.00 0.45	Very limited large stones (very limited)	1.00	Limited large stones (limited) droughty (limited) small stones (moderately limited)	0.99 0.83 0.42
40017: Maplegrove----	Moderately limited wetness (moderately limited) shrink-swell (moderately limited)	0.54 0.45	Very limited wetness (very limited) shrink-swell (slightly limited)	1.00 0.10	Moderately limited wetness (moderately limited) shrink-swell (moderately limited)	0.54 0.45	Very limited low strength (very limited) wetness (moderately limited) shrink-swell (moderately limited)	1.00 0.54 0.45	Moderately limited wetness (moderately limited)	0.54

Table 16.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements		Dwellings with basements		Small commercial buildings		Local roads and streets		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
40018: Medoc-----	Very limited shrink-swell (very limited) wetness (limited)	1.00 0.89	Very limited wetness (very limited) shrink-swell (limited)	1.00 0.78	Very limited shrink-swell (very limited) wetness (limited)	1.00 0.89	Very limited shrink-swell (very limited) wetness (limited)	1.00 0.89	Limited wetness (limited)	0.89
40019: Newtonia-----	Not limited		Slightly limited shrink-swell (slightly limited)	0.12	Not limited		Not limited		Not limited	
Eldorado-----	Limited large stones (limited)	0.96	Limited large stones (limited) shrink-swell (slightly limited)	0.96 0.05	Limited large stones (limited)	0.96	Limited large stones (limited)	0.96	Not limited	
40020: Newtonia-----	Moderately limited shrink-swell (moderately limited)	0.45	Slightly limited shrink-swell (slightly limited)	0.20	Moderately limited shrink-swell (moderately limited)	0.45	Moderately limited shrink-swell (moderately limited)	0.45	Not limited	
Eldorado-----	Limited large stones (limited)	0.96	Limited large stones (limited) shrink-swell (slightly limited)	0.96 0.05	Limited large stones (limited)	0.96	Limited large stones (limited)	0.96	Not limited	
40021: Opolis-----	Very limited shrink-swell (very limited) slope (limited) wetness (limited)	1.00 0.68 0.63	Very limited wetness (very limited) slope (limited) shrink-swell (limited)	1.00 0.68 0.64	Very limited slope (very limited) shrink-swell (very limited) wetness (limited)	1.00 1.00 0.63	Very limited low strength (very limited) shrink-swell (very limited) wetness (limited)	1.00 1.00 0.63	Limited wetness (limited) slope (moderately limited)	0.63 0.37
Hepler-----	Very limited flooding (very limited) wetness (limited)	1.00 0.60	Very limited flooding (very limited) wetness (very limited)	1.00 1.00	Very limited flooding (very limited) wetness (limited)	1.00 0.60	Very limited flooding (very limited) wetness (limited)	1.00 0.60	Moderately limited flooding (moderately limited) wetness (limited)	0.60 0.60

Table 16.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements		Dwellings with basements		Small commercial buildings		Local roads and streets		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
40022: Opolis-----	Very limited shrink-swell (very limited) wetness (limited)	1.00 0.63	Very limited wetness (very limited) shrink-swell (limited)	1.00 0.64	Very limited shrink-swell (very limited) wetness (limited)	1.00 0.63	Very limited low strength (very limited) shrink-swell (very limited) wetness (limited)	1.00 1.00 0.63	Limited wetness (limited)	0.63
40023: Opolis-----	Very limited shrink-swell (very limited) wetness (limited)	1.00 0.63	Very limited wetness (very limited) shrink-swell (limited)	1.00 0.64	Very limited shrink-swell (very limited) wetness (limited)	1.00 0.63	Very limited low strength (very limited) shrink-swell (very limited) wetness (limited)	1.00 1.00 0.63	Limited wetness (limited)	0.63
40024: Opolis-----	Limited wetness (limited) shrink-swell (moderately limited)	0.63 0.45	Very limited wetness (very limited) shrink-swell (moderately limited)	1.00 0.53	Limited wetness (limited) shrink-swell (moderately limited)	0.63 0.45	Very limited low strength (very limited) wetness (limited) shrink-swell (moderately limited)	1.00 0.63 0.45	Limited wetness (limited)	0.63
40026: Sylvania-----	Moderately limited wetness (moderately limited) shrink-swell (moderately limited)	0.45 0.45	Very limited wetness (very limited) shrink-swell (slightly limited)	1.00 0.25	Moderately limited wetness (moderately limited) shrink-swell (moderately limited)	0.45 0.45	Moderately limited wetness (moderately limited) shrink-swell (moderately limited)	0.45 0.45	Moderately limited wetness (moderately limited) small stones (moderately limited) too acid (slightly limited)	0.45 0.33 0.18
40027: Sylvania-----	Moderately limited shrink-swell (moderately limited)	0.45	Limited wetness (limited) shrink-swell (moderately limited)	0.97 0.41	Moderately limited slope (moderately limited) shrink-swell (moderately limited)	0.45 0.45	Moderately limited shrink-swell (moderately limited)	0.45	Very limited small stones (limited) too acid (slightly limited)	1.00 0.18

Table 16.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements		Dwellings with basements		Small commercial buildings		Local roads and streets		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
40028: Sylvania-----	Moderately limited shrink-swell (moderately limited)	0.45	Limited wetness (limited) shrink-swell (moderately limited)	0.87 0.40	Moderately limited slope (moderately limited) shrink-swell (moderately limited)	0.45 0.45	Moderately limited shrink-swell (moderately limited)	0.45	Slightly limited too acid (slightly limited)	0.12
40029: Sylvania-----	Limited slope (limited) wetness (moderately limited) shrink-swell (moderately limited)	0.68 0.45 0.45	Very limited wetness (very limited) slope (limited) shrink-swell (moderately limited)	1.00 0.68 0.45	Very limited slope (very limited) wetness (moderately limited) shrink-swell (moderately limited)	1.00 0.45 0.45	Moderately limited wetness (moderately limited) shrink-swell (moderately limited) slope (moderately limited)	0.45 0.45 0.37	Moderately limited wetness (moderately limited) slope (moderately limited) too acid (slightly limited)	0.45 0.37 0.12
44000: Cherokee-----	Very limited shrink-swell (very limited) wetness (limited)	1.00 0.89	Very limited wetness (very limited) shrink-swell (limited)	1.00 0.70	Very limited shrink-swell (very limited) wetness (limited)	1.00 0.89	Very limited shrink-swell (very limited) wetness (limited)	1.00 0.89	Limited wetness (limited)	0.89
44002: Carl-----	Very limited shrink-swell (very limited) flooding (very limited) wetness (very limited)	1.00 1.00 1.00	Very limited shrink-swell (very limited) flooding (very limited) wetness (very limited)	1.00 1.00 1.00	Very limited flooding (very limited) shrink-swell (very limited) wetness (very limited)	1.00 1.00 1.00	Very limited shrink-swell (very limited) wetness (very limited) flooding (rare) (limited)	1.00 1.00 0.90	Very limited wetness (very limited) too clayey (moderately limited)	1.00 0.60
44004: McCune-----	Limited shrink-swell (limited) wetness (limited)	0.45 0.60	Very limited wetness (very limited) shrink-swell (slightly limited)	1.00 0.23	Limited shrink-swell (moderately limited) wetness (limited)	0.45 0.60	Moderately limited shrink-swell (moderately limited) wetness (slightly limited)	0.45 0.28	Slightly limited wetness (slightly limited) too acid (slightly limited)	0.28 0.06
46001: Verdigris-----	Very limited flooding (very limited)	1.00	Very limited flooding (very limited)	1.00	Very limited flooding (very limited)	1.00	Very limited flooding (very limited)	1.00	Very limited flooding (very limited)	1.00

Table 16.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements		Dwellings with basements		Small commercial buildings		Local roads and streets		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
46002: Hepler-----	Very limited flooding (very limited) wetness (limited)	1.00 0.60	Very limited flooding (very limited) wetness (very limited)	1.00 1.00	Very limited flooding (very limited) wetness (limited)	1.00 0.60	Very limited flooding (very limited) wetness (limited)	1.00 0.60	Moderately limited flooding (moderately limited) wetness (limited)	0.60 0.60
46004: Osage-----	Very limited shrink-swell (very limited) flooding (very limited) wetness (very limited)	1.00 1.00 1.00	Very limited shrink-swell (very limited) flooding (very limited) wetness (very limited)	1.00 1.00 1.00	Very limited flooding (very limited) shrink-swell (very limited) wetness (very limited)	1.00 1.00 1.00	Very limited shrink-swell (very limited) flooding (very limited) wetness (very limited)	1.00 1.00 1.00	Very limited wetness (very limited) flooding (moderately limited) too clayey (moderately limited)	1.00 0.60 0.60
46005: Verdigris-----	Very limited flooding (very limited)	1.00	Very limited flooding (very limited)	1.00	Very limited flooding (very limited)	1.00	Very limited flooding (very limited)	1.00	Moderately limited flooding (moderately limited)	0.60
70006: Crelton-----	Moderately limited shrink-swell (moderately limited) wetness (slightly limited)	0.45 0.13	Very limited wetness (very limited) shrink-swell (moderately limited)	1.00 0.45	Moderately limited shrink-swell (moderately limited) wetness (slightly limited)	0.45 0.13	Very limited low strength (very limited) shrink-swell (moderately limited) wetness (slightly limited)	1.00 0.45 0.13	Slightly limited wetness (slightly limited)	0.13
70012: Hoberg-----	Slightly limited wetness (slightly limited)	0.28	Very limited wetness (very limited)	1.00	Slightly limited wetness (slightly limited)	0.28	Very limited low strength (very limited) wetness (slightly limited)	1.00 0.28	Slightly limited wetness (slightly limited)	0.28
70045: Keeno-----	Slightly limited wetness (slightly limited) large stones (slightly limited)	0.28 0.01	Very limited wetness (very limited) large stones (slightly limited)	1.00 0.01	Limited slope (limited) wetness (slightly limited) large stones (slightly limited)	0.68 0.28 0.01	Slightly limited wetness (slightly limited) large stones (slightly limited)	0.28 0.01	Very limited droughty (very limited) large stones (moderately limited) wetness (slightly limited)	1.00 0.30 0.28

Table 16.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements		Dwellings with basements		Small commercial buildings		Local roads and streets		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
70056: Crackerneck---	Limited slope (limited) large stones (moderately limited) shrink-swell (moderately limited)	0.68 0.58 0.45	Very limited wetness (very limited) slope (limited) large stones (moderately limited)	1.00 0.68 0.58	Very limited slope (very limited) large stones (moderately limited) shrink-swell (moderately limited)	1.00 0.58 0.45	Moderately limited large stones (moderately limited) shrink-swell (moderately limited)	0.58 0.45 0.37	Very limited small stones (very limited) droughty (very limited) large stones (limited)	1.00 1.00 0.99
70057: Crackerneck---	Very limited slope (very limited) large stones (moderately limited) shrink-swell (moderately limited)	1.00 0.58 0.45	Very limited wetness (very limited) slope (very limited) large stones (moderately limited)	1.00 1.00 0.58	Very limited slope (very limited) large stones (moderately limited) shrink-swell (moderately limited)	1.00 0.58 0.45	Very limited slope (very limited) large stones (moderately limited) shrink-swell (moderately limited)	1.00 0.58 0.45	Very limited slope (very limited) small stones (very limited) droughty (very limited)	1.00 1.00 1.00
70058: Crackerneck---	Slightly limited large stones (slightly limited) wetness (slightly limited)	0.18 0.04	Very limited wetness (very limited) large stones (slightly limited) shrink-swell (slightly limited)	1.00 0.18 0.12	Moderately limited slope (moderately limited) large stones (slightly limited) wetness (slightly limited)	0.45 0.18 0.04	Slightly limited large stones (slightly limited) wetness (slightly limited)	0.18 0.04	Very limited small stones (very limited) droughty (limited) too acid (slightly limited)	1.00 0.88 0.24
70059: Goss-----	Very limited slope (very limited) shrink-swell (moderately limited) large stones (slightly limited)	1.00 0.45 0.25	Very limited slope (very limited) large stones (slightly limited) shrink-swell (slightly limited)	1.00 0.25 0.20	Very limited slope (very limited) shrink-swell (moderately limited) large stones (slightly limited)	1.00 0.45 0.25	Very limited slope (very limited) shrink-swell (moderately limited) large stones (slightly limited)	1.00 0.45 0.25	Very limited slope (very limited) small stones (very limited) large stones (limited)	1.00 1.00 0.99
70060: Hoberg-----	Slightly limited wetness (slightly limited)	0.28	Very limited wetness (very limited)	1.00	Slightly limited wetness (slightly limited)	0.28	Slightly limited wetness (slightly limited)	0.28	Slightly limited wetness (slightly limited) droughty (slightly limited)	0.28 0.23

Table 16.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements		Dwellings with basements		Small commercial buildings		Local roads and streets		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
70060: Eldorado-----	Limited large stones (limited)	0.96	Limited large stones (limited) shrink-swell (slightly limited)	0.96 0.05	Limited large stones (limited)	0.96	Limited large stones (limited)	0.96	Not limited	
Pomme-----	Not limited		Not limited		Not limited		Not limited		Not limited	
70061: Pomme-----	Not limited		Not limited		Not limited		Not limited		Not limited	
70062: Pomme-----	Not limited		Not limited		Not limited		Not limited		Not limited	
Rueter-----	Moderately limited large stones (moderately limited)	0.52	Moderately limited large stones (moderately limited) shrink-swell (slightly limited)	0.52 0.18	Moderately limited large stones (moderately limited)	0.52	Moderately limited large stones (moderately limited)	0.52	Very limited small stones (very limited) droughty (limited) large stones (moderately limited)	1.00 0.79 0.30
70063: Rueter-----	Limited large stones (limited) slope (limited)	0.80 0.68	Limited large stones (limited) slope (limited) shrink-swell (slightly limited)	0.80 0.68 0.25	Very limited slope (very limited) large stones (limited)	1.00 0.80	Limited large stones (limited) slope (moderately limited)	0.80 0.37	Limited large stones (limited) droughty (limited) small stones (limited)	0.99 0.99 0.96
70064: Rueter-----	Moderately limited large stones (moderately limited)	0.52	Moderately limited large stones (moderately limited) shrink-swell (slightly limited)	0.52 0.18	Moderately limited large stones (moderately limited)	0.52	Moderately limited large stones (moderately limited)	0.52	Very limited small stones (very limited) droughty (limited) large stones (moderately limited)	1.00 0.79 0.30

Table 16.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements		Dwellings with basements		Small commercial buildings		Local roads and streets		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
70065: Rueter-----	Moderately limited large stones (moderately limited)	0.52	Moderately limited large stones (moderately limited) shrink-swell (slightly limited)	0.52 0.18	Moderately limited large stones (moderately limited) slope (moderately limited)	0.52 0.45	Moderately limited large stones (moderately limited)	0.52	Very limited small stones (very limited) droughty (limited) large stones (moderately limited)	1.00 0.79 0.30
70066: Winnipeg-----	Not limited		Not limited		Not limited		Very limited low strength (very limited)	1.00	Not limited	
71751: Bearthicket---	Very limited flooding (very limited)	1.00	Very limited flooding (very limited)	1.00	Very limited flooding (very limited)	1.00	Very limited flooding (very limited) low strength (very limited)	1.00 1.00	Moderately limited flooding (moderately limited)	0.60
73031: Gerald-----	Limited wetness (limited)	0.60	Very limited wetness (very limited)	1.00	Limited wetness (limited)	0.60	Very limited low strength (very limited) wetness (limited)	1.00 0.60	Limited wetness (limited)	0.60
75376: Cedargap-----	Very limited flooding (very limited)	1.00	Very limited flooding (very limited)	1.00	Very limited flooding (very limited)	1.00	Very limited flooding (very limited)	1.00	Very limited flooding (very limited) small stones (moderately limited)	1.00 0.33
99000: Pits-----	Not rated		Not rated		Not rated		Not rated		Not rated	
Quarries-----	Not rated		Not rated		Not rated		Not rated		Not rated	
99001: Water-----	Not rated		Not rated		Not rated		Not rated		Not rated	
99002: Borrow areas--	Not rated		Not rated		Not rated		Not rated		Not rated	

Table 16.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements		Dwellings with basements		Small commercial buildings		Local roads and streets		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
99003: Miscellaneous water-----	Not rated		Not rated		Not rated		Not rated		Not rated	
99005: Landfill-----	Very limited slope (very limited)	1.00	Very limited slope (very limited)	1.00	Very limited slope (very limited)	1.00	Very limited low strength (very limited) slope (very limited)	1.00 1.00	Very limited slope (very limited)	1.00
99010: Dumps-----	Not rated		Not rated		Not rated		Not rated		Not rated	
Pits-----	Not rated		Not rated		Not rated		Not rated		Not rated	
99011: Kanima-----	Not limited		Not limited		Limited slope (limited)	0.68	Not limited		Very limited small stones (very limited) droughty (slightly limited) too acid (slightly limited)	1.00 0.09 0.06